

SUPPORT FOR THE AMENDMENTS

Support for the amendment of Claim 1 is found on page 6, line 32, of the specification (0.5 to 8% by weight toluene). The description of Claim 3 is included in Claim 1.

Claim 3 is canceled.

Claims 1-2 and 4-15 are amended to use description consistent with Claim 1 and to use wording and structure consistent with U.S. patent law practice.

No new matter is believed added to this application by entry of this amendment.

Upon entry of this amendment, Claims 1-2 and 4-15 are active.

REMARKS/ARGUMENTS

The claimed invention is directed to a process for preparing dinitrotoluene (DNT). Conventionally, DNT is prepared by a two stage method wherein toluene is first mononitrated in a two phase reaction medium. At the completion of the first stage, the aqueous acid phase and organic phase are separated and the separated spent acid recycled while the mononitrotoluene containing organic phase is subjected to further nitration to obtain DNT.

As Applicants have described (page 4, lines 20-42), in order to effectively and safely separate the two phases after mononitration, the available reactants in the mononitration must be depleted (99.5% of the toluene converted) and/or nitric acid content of 0.4 to 1.0%. Otherwise, exothermic reaction will continue during the phase separation and may lead to uncontrolled nitration or run-away exotherm which could cause damage to the equipment or harm in the workplace. Typically, conventional systems consist of units of multiple reactors for each stage of nitration, which requires a complex system of control and maintenance.

Therefore, a method to safely produce DNT, which is simple in operation and employs a minimum number of reactors is sought.

Applicants have addressed this problem by providing the process for preparing DNT as described in Claim 1 and claims dependent thereon. Surprisingly, Applicants have discovered that DNT can be prepared by a method wherein a much higher amount of unreacted toluene can be allowed at the separation of the phases following mononitration (0.5 to 8% by weight of the organic phase) if the phase separation is effected in such a way that further reaction of the toluene with nitric acid is prevented. Specifically, the separation is carried out in a dynamic separator. A dynamic separator is a centrifuge (see Hermann et al. Industrial Nitration of Toluene to Dinitrotoluene, p. 240, last 2 lines) and is distinguished from a conventional static separator wherein the phases are allowed to separate by gravity. No such process is disclosed or suggested in the cited references.

The rejection of Claims 1, 3-11 and 13-15 under 35 U.S.C. 102(b) over Sawicki (U.S. 4,367,347) is respectfully traversed.

Sawicki describes a two stage nitration of toluene, wherein at the completion of the mononitration stage, the organic and aqueous acid phases are allowed to separate by gravity (Col. 5, lines 36-42). As Applicants have described, it is well known to one of ordinary skill in the art that to safely effect separation by gravity either one or both of toluene or nitric acid must be of such low concentration that uncontrolled nitration cannot take place. Sawicki describes that the spent acid contains 0.1 to 1.0 wt % nitrous and nitric acid. As is known to one of ordinary skill, nitrous acid is not a nitrating agent as is nitric acid. As Sawicki is silent with respect to actual nitric acid content and as the reference describes a conventional gravity separation, one of ordinary skill would understand that conventional concentrations of reactants must be present. Moreover, the reference describes an organic phase containing 0.5% unreacted toluene, 20 wt% DNT and 80 wt% mononitrotoluenes (Col. 5, lines 43-45). Aside from the fact that the % values exceed 100% and therefore must be erroneous, Sawicki provides no experimental description of a mononitration system. Therefore, as one of

ordinary skill would recognize, the reference clearly points to low levels of toluene as is conventionally employed and does not disclose or suggest opposing conventional wisdom by allowing comparatively high levels of 0.5 to 8% by weight toluene.

A proper finding of anticipation requires that “[e]very element of the claimed invention ... be literally present, arranged as in the claim. *Perkin-Elmer Corp.*, 732 F.2d at 894, 221 USPQ at 673; *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771-72, 218 USPQ 781, 789 (Fed. Cir. 1983), *cert. denied*, 465 U.S. 1026 [224 USPQ 520] (1984). The identical invention must be described in as complete detail in the reference as is described in the claimed invention.

Applicants respectfully submit that Sawicki does not disclose or suggest separation via a dynamic separator, does not disclose unconventionally high amounts of unreacted toluene in the organic phase following mononitration and does not disclose or suggest effecting the separation of the organic and acid phases following mononitration in such a way that further reaction of the toluene with the nitric acid is prevented. Accordingly, the reference does not provide every element of the claimed invention and Applicants submit that Sawicki can neither anticipate nor render the claimed invention obvious.

In view of all the above, Applicants respectfully request that the rejection of Claims 1, 3-11 and 13-15 under 35 U.S.C. 102(b) over Sawicki be withdrawn.

The rejection of Claim 12 under 35 U.S.C. 103(a) over Sawicki in view of Klingler et al. (U.S. 5,689,018) is respectfully traversed.

Applicants note that Claim 12 depends directly from Claim 1 and includes all the description of the independent claim. The failure of the primary reference to anticipate or render obvious the claimed invention is described above. The Office has acknowledged that Sawicki fails to teach the molar ratio described in Claim 12 and cites Klingler for this purpose (Official Action dated August 20, 2009, page 6, last 2 lines).

Klingler describes nitration of toluene in two distinct stages. Stage 1 is an isothermal reaction (Claim 1) and Stage 2 is adiabatic. Each stage contains separate acid cycles (Col. 4, lines 40-42 and 50-53) and therefore the process described is not of counter current nature with respect to spent acid recycle as is the case with the present application and with Sawicki. The secondary reference does not disclose or suggest the use of a dynamic separator, unconventionally high amounts of unreacted toluene in the organic phase following mononitration and does not disclose or suggest effecting the separation of the organic and acid phases following mononitration in such a way that further reaction of the toluene with the nitric acid is prevented. Therefore, the secondary reference does not provide the description lacking in the primary reference.

Applicants respectfully call the Examiner's attention to the following excerpt from the Office's own discussion of "**Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.***"

"The rationale to support a conclusion that the claim would have been obvious is that **all the claimed elements were known in the prior art** and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention. "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." **If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art,**" (Federal Register, Vol. 72, No. 195, page 57529) (Bold added) (Citations omitted)

As described above, the cited combination of references does not disclose or suggest all the claimed elements of the present invention. Therefore, according to the KSR guidelines cited, a conclusion of obviousness cannot be supported and

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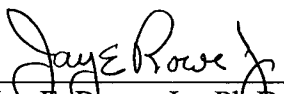
Applicants respectfully request that the rejection of Claim 12 under 35 U.S.C. 103(a) over Sawicki in view of Klingler be withdrawn.

The objection to Claim 1 and the rejections of Claims 1-15 and Claim 15 under 35 U.S.C. 112, second paragraph, are believed obviated by appropriate amendment. The claims are herein amended to use proper antecedent basis, be consistent in description and to use wording and structure consistent with U.S. patent law practice. Withdrawal of the objection and rejections is therefore respectfully requested.

Applicants respectfully submit that the above-identified application is now in condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, L.L.P.  
Norman F. Oblon

  
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Jay E. Rowe, Jr., Ph.D.

Registration No. 58,948

Customer Number

**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 07/09)